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Environmental, economic and performance merits of triple production of water, electricity and renewable energy

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ABSTRACT

The author had earlier proposed an Integrated scheme for seawater desalination, electricity and renewal alternative fuel production. This presentation, however, highlights environmental, economic and performance merits of the proposed scheme. The scheme suggests the integration of beachwell intakes (BWI), nano-filtration (NF), i.e.; selective ions separation with pressure exchanger energy recovery (PEER) devices, solar ponds heat generation (SPHG), ammonia and water steam turbine generator (AWSTG), H_2O electrolyzers (HOEL), mixed fuel engined vehicles (MFEV), fuel cell engined vehicles (FCEV), hydrogen/oxygen gas turbine generators (HOGTG), with AWSTG, i.e. modified combined cycle (MCC), multi stage flash (MSF) distillation, seawater reverse osmosis (SWRO), multi effect distillation (MED), electro-dialysis reversal (EDR) and an innovative membrane distillation (IMD) process. The proposed desalination options are to be put into certain selective hybridization scheme based on site and demand specifics. Moreover, the scheme suggests inclusion of modified (low scaling potential) seawater, hydrogen, oxygen and product water storages plus hydrocarbon, hydrogen and oxygen filling as well as (combustion product pure) water collection stations for vehicles. The article goes into verifying the merits of each system and how would their integration serve the objective of environmental, economic and performance merits of the scheme.

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